Amendments to the Claims:

1. (Currently amended) A magnetic resonance imaging method for performing multi-slice magnetic resonance imaging of a region of interest of an associated imaging subject using a radio frequency coil arranged to generate a B_1 magnetic field in the region of interest, the method comprising:

determining a per-slice B_1 field strength value for each slice that is representative of the B_1 field strength over a selected area of the slice;

determining an adjusted per-slice radio frequency excitation intensity for each slice that adjusts the B_1 field strength value for the slice to a selected B_1 field strength value;

acquiring magnetic resonance imaging data for each slice using the adjusted per slice radio frequency excitation intensity for that slice; and

reconstructing the acquired magnetic resonance imaging data into a reconstructed image representation.

2. (Currently amended) The method as set forth in claim 1, wherein the determining of a per slice B_1 field strength value for each slice comprises:

determining the B_1 field strength across at least the selected area of the slice; and

computing an aggregate value of the determined B_1 field strength across the selected area of the slice.

3. (Currently amended) The method as set forth in claim 2, wherein the computing of an aggregate value comprises:

computing an average, median, or root mean square value of the determined B_1 field strength across the selected area of the slice.

4. (Currently amended) ~~The~~ A magnetic resonance imaging method ~~as set forth in claim 2, wherein the determining of the B_1 field across at least a selected area of the slice comprises:~~ for performing multi-slice magnetic resonance imaging of a region of interest of an associated imaging subject using a radio

frequency coil arranged to generate a B_1 magnetic field in the region of interest, the method comprising:

determining a per-slice B_1 field value for each slice that is representative of the B_1 field over a selected area of the slice by computing the B_1 field numerically using a model of the radio frequency coil and a non-homogeneous model of the imaging subject, the non-homogeneous model of the imaging subject employing different conductivity and permittivity values for different materials of which the imaging subject is formed, and computing an aggregate value of the numerically computed B_1 field across the selected area of the slice;

determining an adjusted per-slice radio frequency excitation for each slice that adjusts the B_1 field value for the slice to a selected value;

acquiring magnetic resonance imaging data for each slice using the adjusted per slice radio frequency excitation for that slice; and

reconstructing the acquired magnetic resonance imaging data into a reconstructed image representation.

5. (Previously presented) The method as set forth in claim 4, wherein the non-homogeneous model of the imaging subject is a non-homogeneous model of at least a portion of a human imaging subject, the model employing different conductivity and permittivity values for different types of tissue.

6. (Currently amended) The method as set forth in claim 2, wherein the determining of the B_1 field strength across at least the selected area of the slice comprises:

measuring a B_1 map of at least the selected area of the slice with one of (1) the region of interest of the imaging subject disposed in the radio frequency coil, (2) the region of interest of a representative distribution of imaging subjects acquired *a priori* in the radio frequency coil, and (3) a spatially non-uniform compartmentalized phantom model of at least the region of interest of the imaging subject disposed in the radio frequency coil.

7. (Currently amended) ~~The~~ A magnetic resonance imaging method ~~as set forth in claim 1, wherein the determining of a per-slice B_1-field value for each slice comprises~~ for performing multi-slice magnetic resonance imaging of a region of interest of an associated imaging subject using a radio frequency coil arranged to generate a B_1 magnetic field in the region of interest, the method comprising:

determining a value of a B_1 field figure of merit for each slice that is representative of the B_1 field over a selected area of the slice;

determining an adjusted per-slice radio frequency excitation for each slice that adjusts the B_1 field figure of merit for the slice to a selected value;

acquiring magnetic resonance imaging data for each slice using the adjusted per slice radio frequency excitation for that slice; and

reconstructing the acquired magnetic resonance imaging data into a reconstructed image representation.

8. (Original) The method as set forth in claim 7, wherein the determining of an adjusted per-slice radio frequency excitation for each slice comprises:

determining an adjusted radio frequency excitation for each slice that adjusts the B_1 field figure of merit to a selected value of the B_1 field figure of merit that is substantially the same for a plurality of slices for which imaging data is acquired.

9. (Currently amended) ~~The~~ A magnetic resonance imaging method ~~as set forth in claim 1, wherein~~ for performing multi-slice magnetic resonance imaging of a region of interest of an associated imaging subject using a radio frequency coil arranged to generate a B_1 magnetic field in the region of interest, the method comprising:

determining a per-slice B_1 field value for each slice that is representative of the B_1 field over a selected area of the slice;

~~the~~ determining ~~of~~ an adjusted per-slice radio frequency excitation for each slice that adjusts the B_1 field value for the slice to a selected value ~~includes determining an adjusted radio frequency excitation for each slice that adjusts the~~

~~per-slice B_1 field value to a selected value~~ that is substantially the same for a plurality of slices for which imaging data is acquired~~, the method further comprising:~~;

determining a specific absorption rate based on the adjusted per-slice radio frequency excitations; ~~and~~

conditional upon the determined specific absorption rate exceeding a regulatory safety limit, repeating the determining of an adjusted per-slice radio frequency excitation for each slice using one of a lower selected value of the per-slice B_1 field value and adjustment of at least one other imaging sequence parameter to reduce the specific absorption rate;

acquiring magnetic resonance imaging data for each slice using the adjusted per slice radio frequency excitation for that slice; and

reconstructing the acquired magnetic resonance imaging data into a reconstructed image representation.

10. (Currently amended) The method as set forth in claim 1, wherein the adjusted per-slice radio frequency ~~excitations~~ excitation intensities are adiabatic radio frequency ~~excitations~~ excitation intensities, and the determining of the adjusted adiabatic radio frequency ~~excitations~~ intensities comprise:

for each slice, computing an adjusted adiabatic radio frequency excitation intensity that substantially corrects for a variation of the B_1 field strength across the selected area of the slice to provide more uniform flip angles.

11. (Currently amended) ~~The~~ A magnetic resonance imaging method ~~as set forth in claim 1, further~~ for performing multi-slice magnetic resonance imaging of a region of interest of an associated imaging subject using a radio frequency coil arranged to generate a B_1 magnetic field in the region of interest, the method comprising:

determining a per-slice B_1 field value for each slice that is representative of the B_1 field over a selected area of the slice;

determining an adjusted per-slice radio frequency excitation for each slice that adjusts the B_1 field value for the slice to a selected value;

acquiring magnetic resonance imaging data for each slice using the adjusted per slice radio frequency excitation for that slice;

reconstructing the acquired magnetic resonance imaging data into a reconstructed image representation; and

moving the associated imaging subject in a direction transverse to the slices, the determining of a per-slice B_1 field value, the determining of an adjusted per-slice radio frequency excitation, and the acquiring of magnetic resonance imaging data being repeated for a stationary slice position with the imaging subject moved relative to the stationary slice position between each repetition.

12. (Previously presented)The method as set forth in claim 11, wherein the moving of the associated imaging subject is one of:

in discrete steps, with the subject motionless during each repetition of the acquiring, and

continuous, with the subject moving during each repetition of the acquiring.

13. (Previously presented)A magnetic resonance imaging apparatus comprising:

a main magnetic field coil generating a main magnetic field;

magnetic field gradient coils selectively generating magnetic field gradients;

a radio frequency coil arranged to generate a B_1 magnetic field in a region of interest of an associated imaging subject;

a radio frequency transmitter selectively energizing the radio frequency coil;

a radio frequency receiver selectively sampling the radio frequency coil; and

a processor programmed to perform the method of claim 1.

14. (Currently amended) A magnetic resonance imaging apparatus for performing multi-slice magnetic resonance imaging of a region of interest of an associated imaging subject, the apparatus comprising:

a radio frequency coil arranged to generate a B_1 magnetic field in the region of interest;

a means for determining a per-slice B_1 field value for each slice that is representative of the B_1 field over a selected area of the slice, the determining means comprising at least one of:

an electromagnetic simulator receiving a digital model of the region of interest and a digital model of the radio frequency coil and estimating the B_1 field generated across the region of interest, the digital model of the region of interest mimicking non-uniform dielectric and conductivity properties of the region of interest, and

a table of adjusted per-slice radio frequency excitation versus slice position derived from the per-slice B_1 field values;

a means for determining an adjusted per-slice radio frequency excitation for each slice that adjusts the B_1 field value for the slice to a selected value;

a ~~means for acquiring~~ magnetic resonance imaging scanner configured to acquire magnetic resonance imaging data for each slice using the adjusted per-slice radio frequency excitation for that slice; and

a ~~means for reconstructing~~ reconstruction processor configured to reconstruct the acquired magnetic resonance imaging data into a reconstructed image representation.

15. (Currently amended) The apparatus as set forth in claim 14, wherein the means for determining a per-slice B_1 field value for each slice comprises[[:]]

~~an~~ said electromagnetic simulator receiving [[a]] the digital model of the region of interest and the digital model of the radio frequency coil and estimating

the B_1 field generated across the region of interest, the digital model of the region of interest mimicking non-uniform dielectric and conductivity properties of the region of interest.

16. (Previously presented) The apparatus as set forth in claim 15, wherein the electromagnetic simulator employs a finite difference time domain algorithm.

17. (Previously presented) The apparatus as set forth in claim 14, wherein the means for determining a per-slice B_1 field value for each slice comprises:

a means for determining a value of a figure of merit for each slice that is representative of the B_1 field over a selected area of the slice.

18. (Previously presented) The apparatus as set forth in claim 17, wherein the means for determining a value of a per-slice B_1 field figure of merit for each slice that is representative of the B_1 field over a selected area of the slice comprises:

a statistical aggregation means for calculating an aggregate value representative of the B_1 field over the selected area of the slice.

19. (Currently amended) The apparatus as set forth in claim 14, wherein the means for determining an adjusted per-slice radio frequency excitation for each slice comprises[[:]]

[[a]] <u>said</u> table of adjusted per-slice radio frequency excitation versus slice position derived from the per-slice B_1 field values.

20. (Previously presented) The apparatus as set forth in claim 14, further comprising:

a means for determining a specific absorption rate based on the adjusted per-slice radio frequency excitations; and

conditional upon the determined specific absorption ratio exceeding a regulatory safety limit, repeating the determining of an adjusted per-slice radio

frequency excitation for each slice using one of lower selected values of the per-slice B_1 field value and adjustment of at least one other imaging sequence parameter to reduce the specific absorption rate.